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Pregnancy-associated breast cancer (PABC) is breast cancer that is diagnosed during pregnancy, lactation, or within one year of delivery (Ulery, Carter, McFarlin, & Giurgescu, 2009). While the standard approaches to breast cancer treatment include surgery, chemotherapy and radiation, a concurrent pregnancy poses ethical issues due to the potential teratogenicity (i.e., the capability of producing fetal developmental abnormalities) of treatment options that would benefit the mother. Due to the rarity of the condition, case reports, small retrospective studies and literature reviews about PABC treatment are limited in number within the current literature base, thus making evidence-based treatment recommendations difficult. Contemporary literature suggests that chemotherapy during the first trimester is contraindicated. However, while in-utero exposure to many of the chemotherapeutic agents during the second and third trimesters may increase risk of intrauterine growth retardation and low birth weight, the risk of serious malformation or death of the fetus is not significantly different compared to the risk for the general population of women. PABC treatment requires a strong focus on educating the patient about the risks and benefits of all her options, and providing the appropriate support to make this ethically challenging decision about cancer care and pregnancy.

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Abstract

Pregnancy-associated breast cancer (PABC) is breast cancer that is diagnosed during pregnancy, lactation, or within one year of delivery (Ulery, Carter, McFarlin, & Giurgescu, 2009). While the standard approaches to breast cancer treatment include surgery, chemotherapy and radiation, a concurrent pregnancy poses ethical issues due to the potential teratogenicity (i.e., the capability of producing fetal developmental abnormalities) of treatment options that would benefit the mother. Due to the rarity of the condition, case reports, small retrospective studies and literature reviews about PABC treatment are limited in number within the current literature base, thus making evidence-based treatment recommendations difficult. Contemporary literature suggests that chemotherapy during the first trimester is contraindicated. However, while in-utero exposure to many of the chemotherapeutic agents during the second and third trimesters may increase risk of intrauterine growth retardation and low birth weight, the risk of serious malformation or death of the fetus is not significantly different compared to the risk for the general population of women. PABC treatment requires a strong focus on educating the patient about the risks and benefits of all her options, and providing the appropriate support to make this ethically challenging decision about cancer care and pregnancy.

Pregnancy-associated breast cancer (PABC) is breast cancer that is diagnosed during pregnancy, lactation, or within one year of delivery (Ulery, Carter, McFarlin, & Giurgescu, 2009). A diagnosis of cancer during pregnancy is very uncommon (Beidler, 2000; Partridge & Schapira, 2005; Pereg, Koren, & Lishner, 2008). Approximately 1 in 3,000 women are diagnosed with breast cancer during pregnancy in the United States (Visco, Meyer, Xi, & Brown, 2009), making PABC rare when compared with the lifetime breast cancer risk of 1 in 8 women among the general population (Goldman & O’Hair, 2009). However, of all pregnancy-associated cancers, breast is one of the most frequently identified primaries (Cardonick, Usmani & Ghaffar, 2009; Psyrris & Burtness, 2005; Visco et al., 2009). Cancer risk increases with age, and as more women delay childbearing until their 30s or 40s, the incidence of PABC is expected to rise (Goldman & O’Hair, 2009; Pereg et al., 2008). Surgery, chemotherapy and radiation are the standard approaches to breast cancer treatment (Partridge & Schapira, 2005; Visco et al., 2009), however management of PABC with these treatment modalities requires careful consideration of the lives of both mother and fetus.

Dictionary (2002) defines “ethics” as “the science or study of moral values or principles, including ideals of autonomy, beneficence, and justice.” Treatment of PABC poses ethical challenges in upholding these principles in regards to both mother and baby. Chemotherapy is cytotoxic in nature, in that it kills rapidly dividing cells and may result in genetic damage (Partridge & Schapira, 2005; Patni et al., 2007). While the mother may benefit from chemotherapy’s anti-cancer effects, the developing fetus may be at risk for teratogenic (i.e., capable of producing fetal developmental abnormalities) (Mosby’s medical, nursing & allied health dictionary, 2002) effects such as spontaneous abortion, intrauterine growth retardation (IUGR), organ toxicity, premature birth, and low birth weight (Beidler, 2000; Partridge & Schapira, 2005; Visco et al., 2009). Radiation therapy, although an important aspect of maximally effective breast cancer treatment, would expose a fetus to intolerable levels of scatter radiation posing risk of IUGR, congenital malformations, or fetal demise (Beidler, 2000; Goldman & O’Hair, 2009; Partridge & Schapira, 2005; Visco et al., 2009). Even surgical removal of malignant tissue, which is the ultimate goal of breast cancer management, poses potential threats to the health of both mother and baby in the context of PABC. While there is concern about exposing the fetus to anesthesia during surgery, there is also dimin-

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Years in the US and English Comfort Level

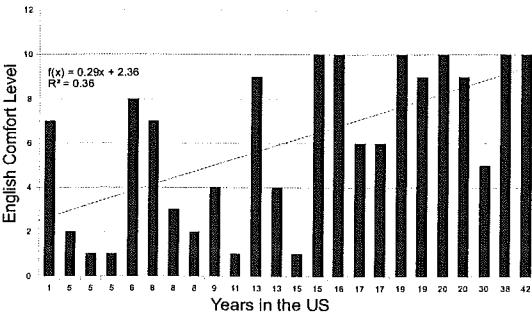


Figure 3. Participants’ years living in the U.S. and their self-described comfort level with English. There is a positive correlation between longer length of time living in the U.S. and higher comfort level with English.

The Importance of a Spanish-Speaking Doctor

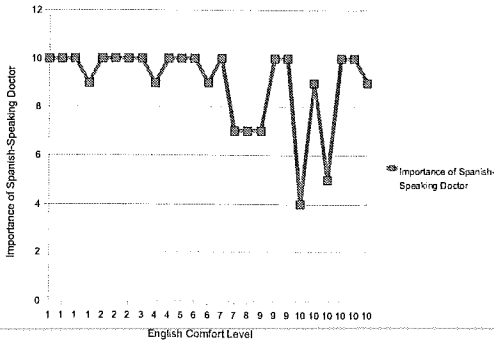
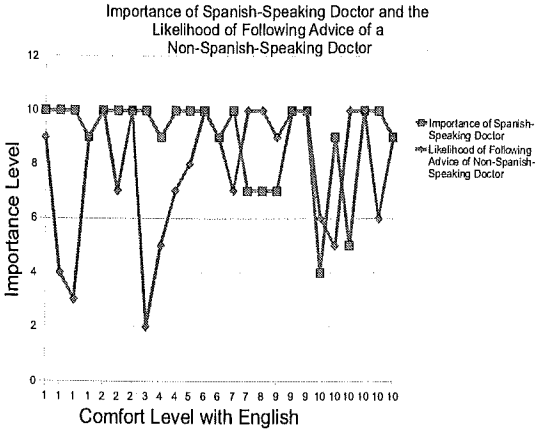


Figure 4. Comfort level with speaking English and the importance seeing a Spanish-speaking doctor. Even some women who said they were very comfortable with English preferred a Spanish-speaking doctor.

Figure 5. Comfort level with speaking English, the importance of seeing a Spanish-speaking doctor, and the likelihood of following the advice of a non-Spanish-speaking doctor. In general, women who gave higher importance to having a Spanish-speaking doctor reported that they would be less likely to follow the advice of a non-Spanish-speaker; women who gave lower importance to having a Spanish-speaking doctor said they would be likely to follow the advice of a non-Spanish speaker.



| Self-Reported Comfort Level with speaking English on a scale of 1-10 | Number of Participants who self-reported in each category | Qualitative Descriptors for general categorization |
|--|---|--|
| 1 | 4 | Not comfortable (1-3) n=8 |
| 2 | 3 | |
| 3 | 1 | |
| 4 | 2 | Somewhat comfortable (4-7) n=7 |
| 5 | 1 | |
| 6 | 2 | |
| 7 | 2 | |
| 8 | 1 | Very comfortable (8-10) n=10 |
| 9 | 3 | |
| 10 | 6 | |

Table 1. Participants’ self-rated comfort level with speaking English. Qualitative descriptors were added in column three to demonstrate the even distribution of English Comfort Level among women in the sample.

ished flexibility in the choice of surgical intervention for the mother, often necessitating the removal of more tissue than if she were not pregnant (Visco et al., 2009). PABC management poses the ethical dilemma of how to prioritize treatment decisions and optimize outcomes for the mother, the baby, or both (Beidler, 2000).

The existing body of literature about PABC consists mostly of small retrospective studies, case reports, and literature reviews. This is due to small sample sizes, secondary to the rarity of the condition, as well as the lack of feasibility in conducting large prospective studies or randomized clinical trials (Beidler, 2000; Pereg et al., 2008). This lack of evidence-based knowledge to guide practice forces clinicians to rely on past experience and intuition, making treatment recommendations about this sensitive and ethically charged issue difficult (Partridge & Schapira, 2005; Ulery et al., 2009; Visco et al., 2009).

Patni et al. (2007) present a dramatic case report that illustrates the significant impacts of "me or baby" decision-making (Beidler, 2000). The case presented is that of a 40-year old woman diagnosed at 22-weeks gestation with metastatic adenocarcinoma of uncertain primary origin (one possibility being the breast.) Despite her very poor prognosis, after a long history of infertility she decided to continue her pregnancy without treatment. A caesarean section was planned for 27 weeks gestation, but the baby was delivered at 25 weeks and 3 days due to rapid maternal deterioration, and the mother died 36 hours later. Patni et al. (2007) reviewed her case in the context of Beauchamp and Childress's "four principles" approach to medical ethics, establishing that respect for autonomy (i.e., ability to make competent decisions based on information provided), beneficence (i.e., promotion of well-being), nonmaleficence (i.e., obligation to avoid harming patients) and justice (i.e., receiving due benefits or burdens) were upheld in the patient-directed management of her pregnancy and cancer care. This case demonstrates the life-or-death nature of this issue, and that the choices on how to manage pregnancy and cancer care, weighing risks and benefits for both herself and her unborn child, are ultimately up to the patient.

The rarity of PABC poses issues in establishing standardized approaches in its management, thus Cardonick et al. (2009) pooled information regarding diagnosis and treatment of PABC in 128 women nationwide using the Cancer and Pregnancy Registry. Of these women, 10 elected to terminate their pregnancies, 6 had spontaneous miscarriage, and 99 received chemotherapy during their second or third trimester. Mean birth weight of the babies exposed to chemotherapy in-utero was significantly lower than those who were not. Of the neonates exposed to chemotherapy, 13 experienced complications at birth or during the newborn period, including sepsis and anemia, gastroesophageal reflux, difficulty feeding, hyperbilirubinemia, transient tachypnea and respiratory distress syndrome.

Using the Cancer and Pregnancy Registry, Cardonick et al. (2009) followed the neonates born to PABC patients for an average of 42 months. Mean height and weight of these children were in the were at forty-eighth and fifty-eighth percentile, respectively, but a few experienced long-term issues such as gastroesophageal reflux, eczema, sinusitis, mild speech delay, mild hearing loss, recurrent otitis media, reactive airway disease, selective IgA deficiency (no treatment required) and corneal abrasion. This and other papers acknowledge the need for more stringent long-term follow up of children born to women treated for PABC during pregnancy to gather more information about the late effects of in-utero chemotherapy exposure (Cardonick et al., 2009; Logue, 2009). Cardonick et al. (2009) conclude that if the risk to the mother outweighs the benefits of delayed treatment, and termination of pregnancy is not an acceptable option to the patient, chemotherapy may be considered during pregnancy without significantly increasing the risk of malformations above that of the general population.

Pereg et al. (2008) performed a literature review about the diagnosis and treatment of cancer in pregnancy using MEDLINE and Cochrane Controlled Trials Register databases. They reported information about PABC prognosis, tumor characteristics, barriers to standard cancer care, and treatment considerations to reduce risk to mother and baby. The first barrier to effective PABC treatment is delayed diagnosis by an average of five to seven months, because symptoms consistent

with breast cancer, including lumps, discharge, swelling and tenderness, are often attributed to the normal breast changes experienced during pregnancy (Partridge & Schapira, 2005; Pereg et al., 2008; Ulery et al., 2009; Visco et al., 2009). Diagnosis may also be delayed due to the high incidence of false negative mammography results in PABC patients, which also translates to a greater risk of metastases and poorer patient outcomes (Ulery et al., 2009). PABC patients exhibit poor histological and prognostic features, with a majority of tumors having estrogen and progesterone receptor (ER, PR) negativity and human epidermal growth factor receptor 2 (HER2) positivity. Young women, pregnant or not, generally present with aggressive disease, and PABC patients are often diagnosed with more advanced disease and are at greater risk for metastases (Pereg et al., 2008).

Pereg et al. (2008) explain that most chemotherapy agents are able to cross the placenta and reach the fetus. Exposure to these cytotoxic agents during the first trimester, at the height of fetal organogenesis, may increase the risk of miscarriage, fetal death and major malformation. Chemotherapy exposure during the second and third trimesters, however, is not associated with teratogenic effects, but increases the risk of IUGR and low birth weight. Certain drugs must be avoided during pregnancy, such as Herceptin (used to treat HER2+ cancer) which is associated with anhydramnios, and Methotrexate which has anti-folate activity and is associated with fetal malformation (Visco et al., 2009). Tamoxifen, which is widely used in the treatment of ER+ breast cancers, is a category D drug and is also contraindicated during pregnancy due to its potentially teratogenic effects and associated gynecologic toxicities (Ulery et al., 2009). Labor and delivery pose risk for infection and hemorrhage, which is increased in the context of chemotherapy-induced myelosuppression, so chemotherapy should be suspended at least 3-4 weeks prior to expected or scheduled delivery. Finally, Pereg and colleagues address the ethical considerations of PABC, acknowledging that while the mother may derive life-saving benefits from chemotherapy, the baby could be at risk for malformation or death.

The current approaches to management of PABC include delay of treatment until after normal delivery, preterm delivery of the baby, treatment during

pregnancy, or termination of the pregnancy (Beidler, 2000; Cardonick et al., 2009; Logue, 2009; Partridge & Schapira, 2005). Since radiation therapy is contraindicated during pregnancy, the favored surgical approach to PABC is usually modified radical mastectomy with axillary dissection, with chemotherapy either before or after surgery if appropriate (Halaska et al., 2009; Partridge & Schapira, 2005). While some choose to delay receiving potentially teratogenic treatment until after the baby is born, chemotherapy cannot safely be delayed in all cases (Cardonick et al., 2009; Patni et al., 2007). Delaying PABC treatment by just three to six months can raise risk of metastases by 5-10% (Logue, 2009). Thus the ethical dilemma lies in the "maternal-fetal conflict" (Pereg et al., 2008), and the goal of management is to decide how to optimize outcomes for both mother and baby (Beidler, 2000; Patni et al., 2007). PABC care requires a multidisciplinary care team, including oncology, obstetrics, neonatology, and nursing, and an individually tailored approach depending on the stage of cancer, gestational age of the fetus, and personal beliefs and preferences of the patient (Beidler, 2000; Cardonick et al., 2009; Halaska et al., 2009; Logue, 2009; Partridge & Schapira, 2005; Patni et al., 2007).

Given the complexity of PABC and the potential for associated psychological distress, nursing roles in education, toxicity management and psychosocial support are particularly important. Nursing care for women with PABC must include a strong focus on patient and family education about treatment options, identification of knowledge deficits, and referral for support services while the patient and family are making difficult life or death decisions (Goldman & O'Hair, 2009; Logue, 2009). Even prior to a PABC diagnosis, nurses should be aware of the risk for PABC and perform a baseline breast exam at the first prenatal visit. Nurses should educate their patients about the symptoms of breast cancer as well as the normal breast changes to expect during pregnancy, and encourage patients to continue self-breast exam throughout their pregnancy, as PABC most commonly presents as a painless lump palpated by the patient or clinician (Ulery et al., 2009). During treatment, symptoms that occur during pregnancy and chemotherapy separately, such as nausea and vomiting, may be more severe, thus oral hydration and food intake must be encour-

aged and assessment for dehydration is vital. Hematology and chemistry labs should be monitored regularly, and ultrasound imaging of the fetus may be indicated prior to each cycle of chemotherapy (Logue, 2009).

The lack of evidence-based practice guidelines for this rare patient population poses barriers to providing clinically and ethically sound recommendations. Clinical priorities will vary across disciplines; however, it is not the role of clinicians to impose their opinions during the decision-making process. Instead, the goal is to provide the patient and her family with the information and tools to make choices that support their own on their values and beliefs.

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